497

Dop. 5/22

SERVICE MANUAL

PM493

4822 725 50878

marantz®

model PM493

Audio / Video Master Amplifier

497

MARANTZ DESIGN AND SERVICE

Using superior design and selected high grade components, MARANTZ company has created the ultimate in stereo sound.
Only **original MARANTZ parts** can insure that your MARANTZ product will continue to perform to the specifications for which it is famous.

Parts for your MARANTZ equipment are generally available to our National Marantz Subsidiary or Agent.

MARANTZ INTERNATIONAL
Vestdijk 9
5600 MD Eindhoven
The Netherlands
Phone: +31/40.758290
Telefax: +31/40.75.82.99
Telex: 35000 PHTC NL routing IND NLMTFAT

ORDERING PARTS:

Parts can be ordered either by mail or by telex. In both cases, correct part number has to be specified.
The following information must be supplied to eliminate delays in processing your order:

1. Complete address
2. Complete part numbers and quantities required
3. Description of parts
4. Model number for which part is required
5. Way of shipment
6. Signature: any order form or telex must be signed otherwise such part order will be considered as null and void.

PARTS ORDERING

Parts may be ordered at the following addresses:

AUSTRIA
HORNYPHON
Vertriebsgesellschaft GmbH
Wienerbergstrasse 1
A 1101 Wien
Austria
Telex: 132.332

BELGIUM
SVD DIVISION MARANTZ
Industrialaan 1
1720 Groot-Bijgaarden
Belgium
Telex: 24466

CHILE
MARANTZ
DIVISION OF PHILIPS S.A.
AV. Santa Maria, 0760
Casilla 2687
Santiago
Telex: 240.239

DENMARK
MARANTZ
DIVISION OF PHILIPS
SERVICE A/S
Prags Boulevard 80
Postbox 1919
DK-2300 København S
Denmark
Telex: 31201

FINLAND
MARANTZ
DIVISION OF OY PHILIPS Ab
Kaivokatu 8
00100 Helsinki
Finland
Telex: 124811

FRANCE
MARANTZ FRANCE
4 Rue Bernard Palissy
92600 Asnières
France
Telex: 611651

GERMANY
MARANTZ GERMANY GmbH
Alexanderstrasse 1
2000 Hamburg
Germany

THE NETHERLANDS
Elpro Marantz
Wint Hontlaan 28
3526 KV Utrecht
The Netherlands
Telex: 4748

NORWAY
MARANTZ
DIVISION OF PHILIPS A/S
Sandstuveien 40
0680 Oslo 6
Norway
Telex: 72640

GREAT BRITAIN
MARANTZ AUDIO U.K. Ltd
Unit 15/16
Saxon Way Industrial Estate
Moor Lane
Harmondsworth UB7 OLW
Great Britain
Telex: 935196

GREECE
SHERTON ELECTRONICS S.A.
P.O.Box 21025
Hippocratus Street 188
Athens 11471
Greece
Telex: 216.795

JAPAN
MARANTZ JAPAN, Inc.
35-1, 7-chome, Sagamiono
Sagamihara-shi, Kanagawa
Japan

KUWAIT
AL ALAMIAH ELECTRONICS
Ussama Building
Fahd al Saleem Street
P.O.Box 23781
Safat-Kuwait
Telex: 22694

ITALY
MARANTZ ITALIANA S.P.A.
Via Chiese, 74
20126 Milano
Italy

SAUDI ARABIA
AL ALAMIAH ELECTRONICS
P.O.Box 5954
University Street
Riyadh 11432
Saudi Arabia
Telex: 401530

SOUTH AFRICA
MARANTZ
DIVISION OF PHILIPS S.A.
Main Road Martindale
P.O. Box. 58088
Newville 21114
South Africa

SPAIN
PHONO S.A.
Ignacio Iglesias 10
Badalona (Barcelona)
Spain
Telex: 59355

SWEDEN
MARANTZ
DIVISION OF PHILIPS
Försäljning AB
Tegeluddsvägen 1
S-115 84 Stockholm
Sweden
Telex: 14060

SWITZERLAND
MARANTZ
Technischer Servic
Duenstrasse 3
3186 Düdingen
Switzerland

TURKEY
DOGRUOL Ltd.
I.M.C.
6 Blok N°6310
Unkapani
Istanbul
Turkey
Telex: 22085

MALTA
CACHIA & GALEA
Republic Street, 68D
Valetta
Telex: 1682

PORTUGAL
MARANTZ
Divisao philips S.A. /ice
Outurela-carnaxide
2795 LinDA-A-VELHA
Telex: 43906

All of the above locations are fully equipped to take care of your total service needs. Because various countries have differing configuration requirements, it is necessary that you contact the service facility in your particular country. In the event that there is no service location listed for your country, please, contact the nearest facility for the necessary assistance.

In case of difficulties, do not hesitate to contact the Technical Department at abovementioned address.

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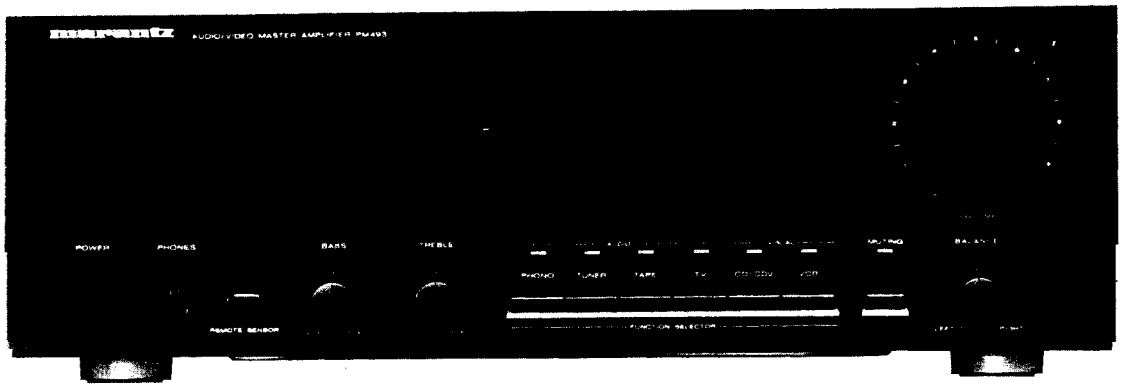
How to use this service manual

- The "Common parts" which Marantz Japan, Inc. has established are eliminated from this service manual.
- These "Common parts" are applied to all models in the service manuals arranged and issued by MJI.
- To indicate clearly the common parts in the schematic diagram, a line is drawn above or under the Ref. Desig. No. of applicable parts.
- "Common parts" can be supplied from the Marantz service center as ever.
  In case of ordering, please establish the parts number of 12 N/C'S following the procedure mentioned in this service manual "How to establish the parts number for common parts".

1) Please correctly write the parts number of 12 N/C'S following the rule.

MODEL PM493 AUDIO/VIDEO MASTER AMPLIFIER



1. P.W. BOARDS

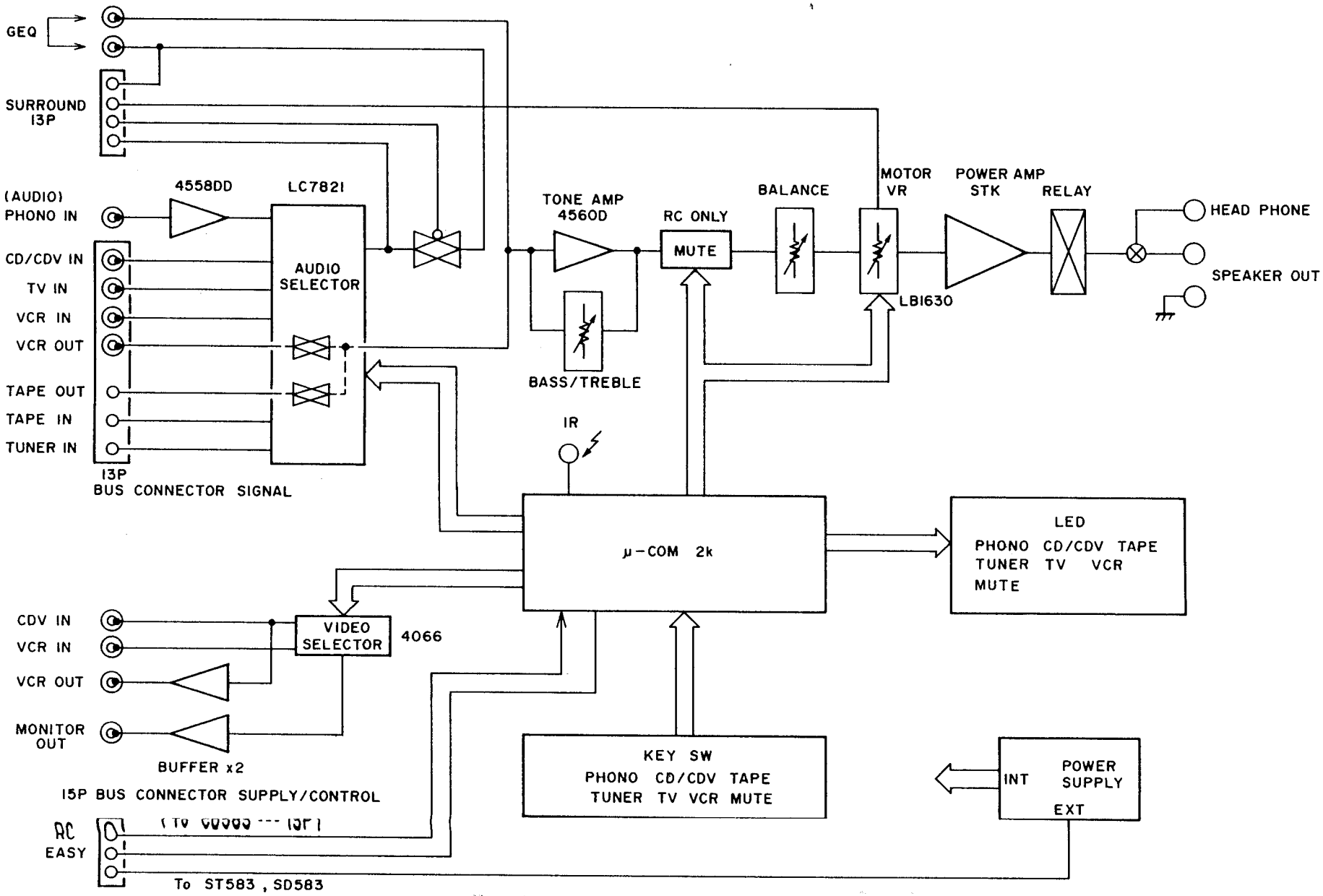
As can be seen from the circuit diagram the chassis of Model PM493 consists of the following units. Each unit mounted on a printed circuit board is described within the square enclosed by a bold dotted line on the circuit diagram.

1. **Volume ..... mounted on P.W. Board PG04**
2. **Video Amp ..... mounted on P.W. Board PL04**
3. **Power Switch ..... mounted on P.W. Board PP04**
4. **μ-COM ..... mounted on P.W. Board PU04**
5. **Rear Terminal ..... mounted on P.W. Board PV04**
6. **Headphone Jack .... mounted on P.W. Board PW04**
7. **Volume Knob Pointer ..... mounted on P.W. Board PZ04**
8. **Main Amp ..... mounted on P.W. Board P704**

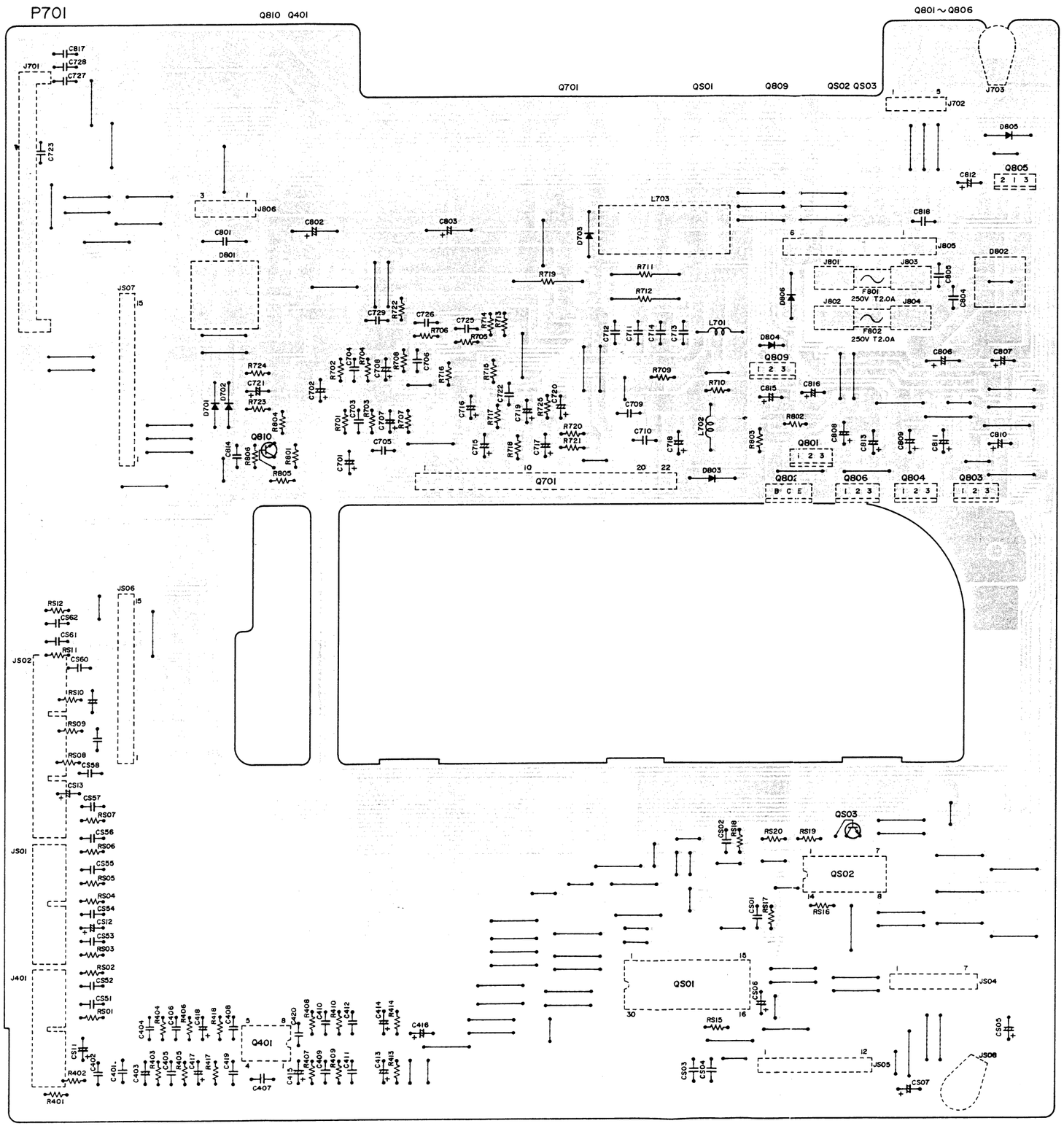
2. TEST EQUIPMENT REQUIRED FOR SERVICING

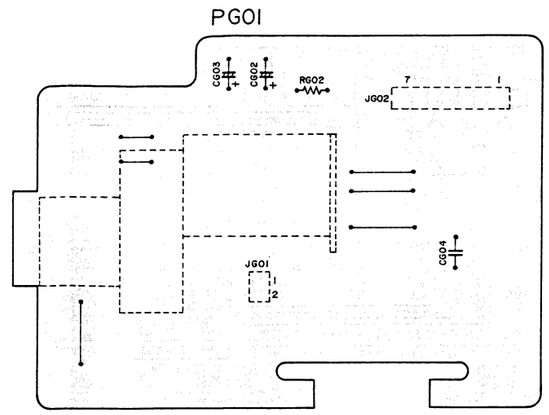
This table lists the test equipment required for servicing the Model PM493 Audio/Video Master Amplifier.

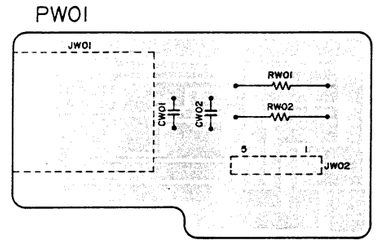
Item	Use
Distortion Analyzer	Distortion measurements
Audio Oscillator	Sinewave and squarewave signal source
ACVTVM	Voltage measurements (AC)
Oscilloscope	Waveform analysis and trouble shooting and ASO alignment
Circuit Tester	Trouble shooting
DCVTVM	Voltage measurements (DC)
AC Wattmeter	Monitors primary power to amplifier
Line Voltmeter	Monitors potential of primary power to amplifier
Variable Autotransformer (0 to 140V AC, 10A)	Adjust level of primery power to amplifier
Shorting Plug	Shorts amplifier input to eliminate noise pickup

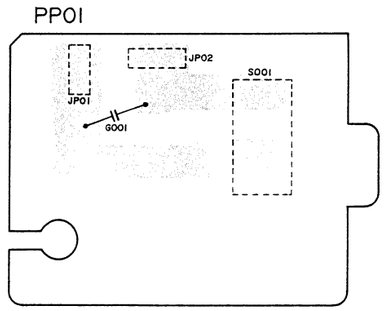

GEQ
SURROUND 13P
(AUDIO) PHONO IN
4558DD
LC7821
CD/CDV IN
TV IN
VCR IN
VCR OUT
TAPE OUT
TAPE IN
TUNER IN
AUDIO SELECTOR
13P BUS CONNECTOR SIGNAL
TONE AMP 4560D
BASS/TREBLE
RC ONLY
MUTE
BALANCE
MOTOR VR
LB1630
POWER AMP STK
RELAY
HEAD PHONE
SPEAKER OUT
IR
μ-COM 2k
LED
PHONO CD/CDV TAPE
TUNER TV VCR
MUTE
CDV IN
VCR IN
VCR OUT
MONITOR OUT
VIDEO SELECTOR
4066
BUFFER x2
15P BUS CONNECTOR SUPPLY/CONTROL
RC EASY
To ST583 , SD583
KEY SW
PHONO CD/CDV TAPE
TUNER TV VCR MUTE
INT
POWER SUPPLY
EXT

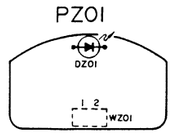
4. PARTS LOCATIONS (Pattern Side)



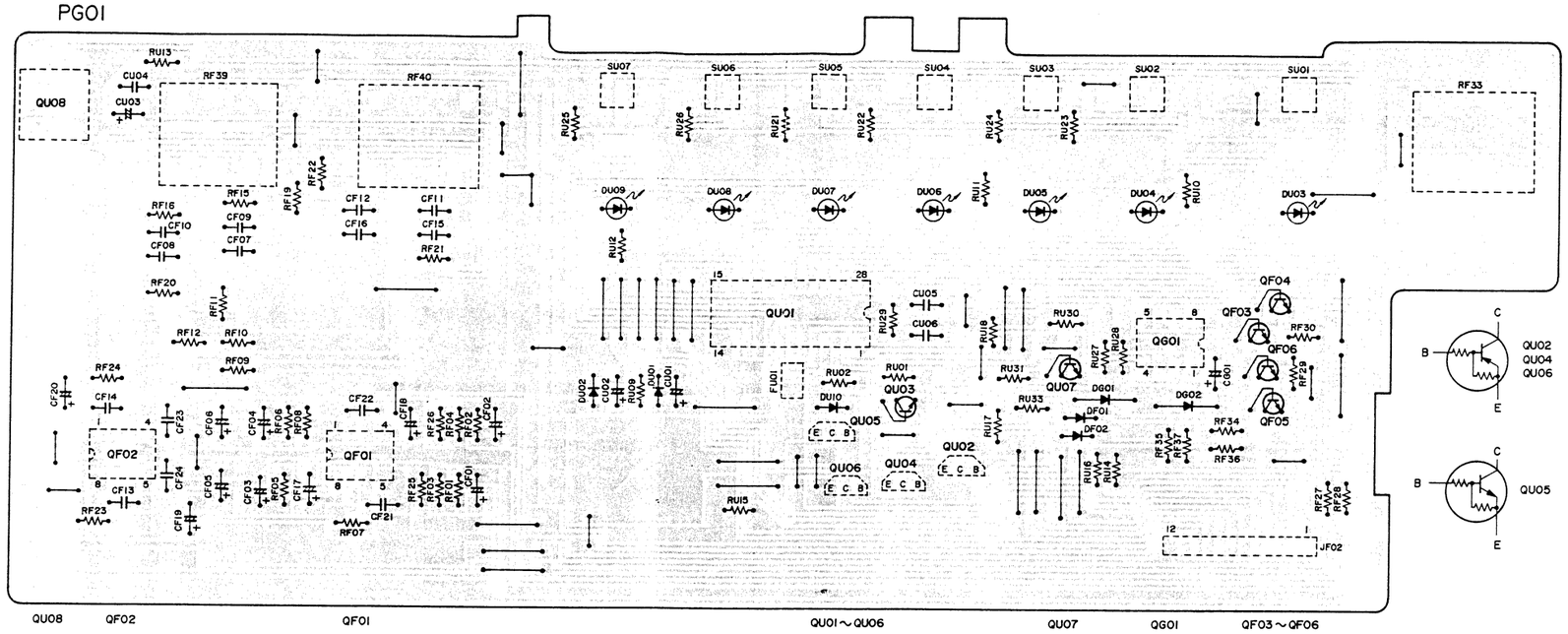




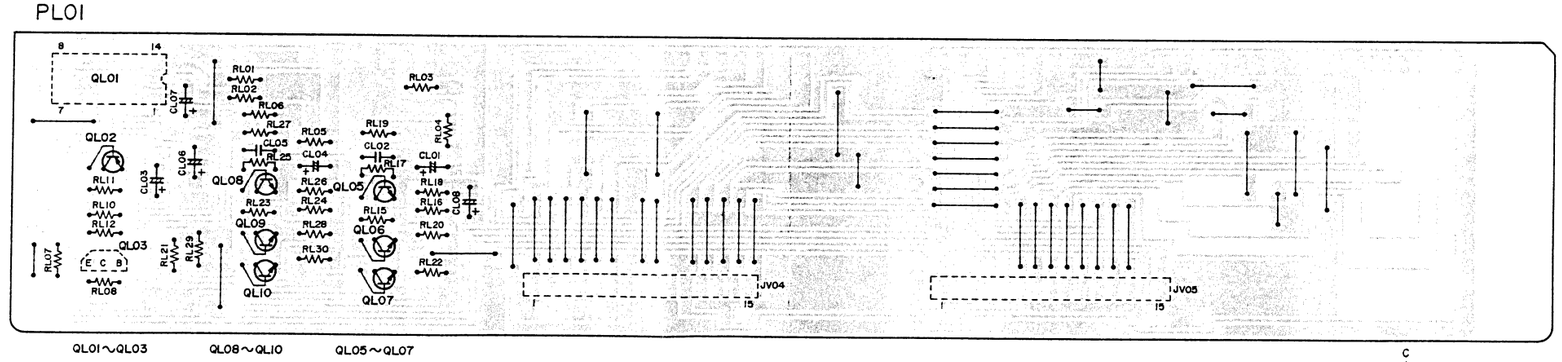




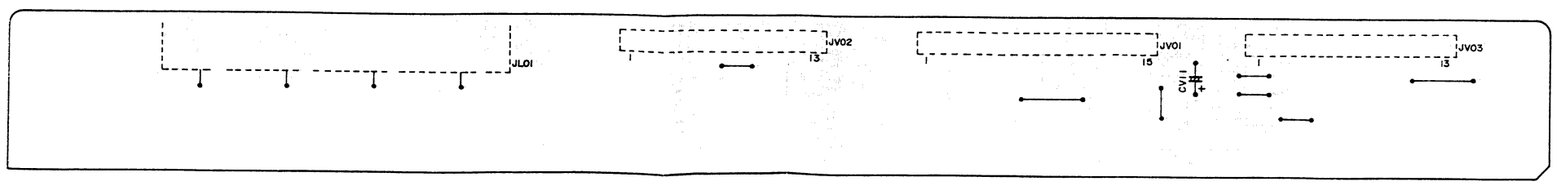
PG01



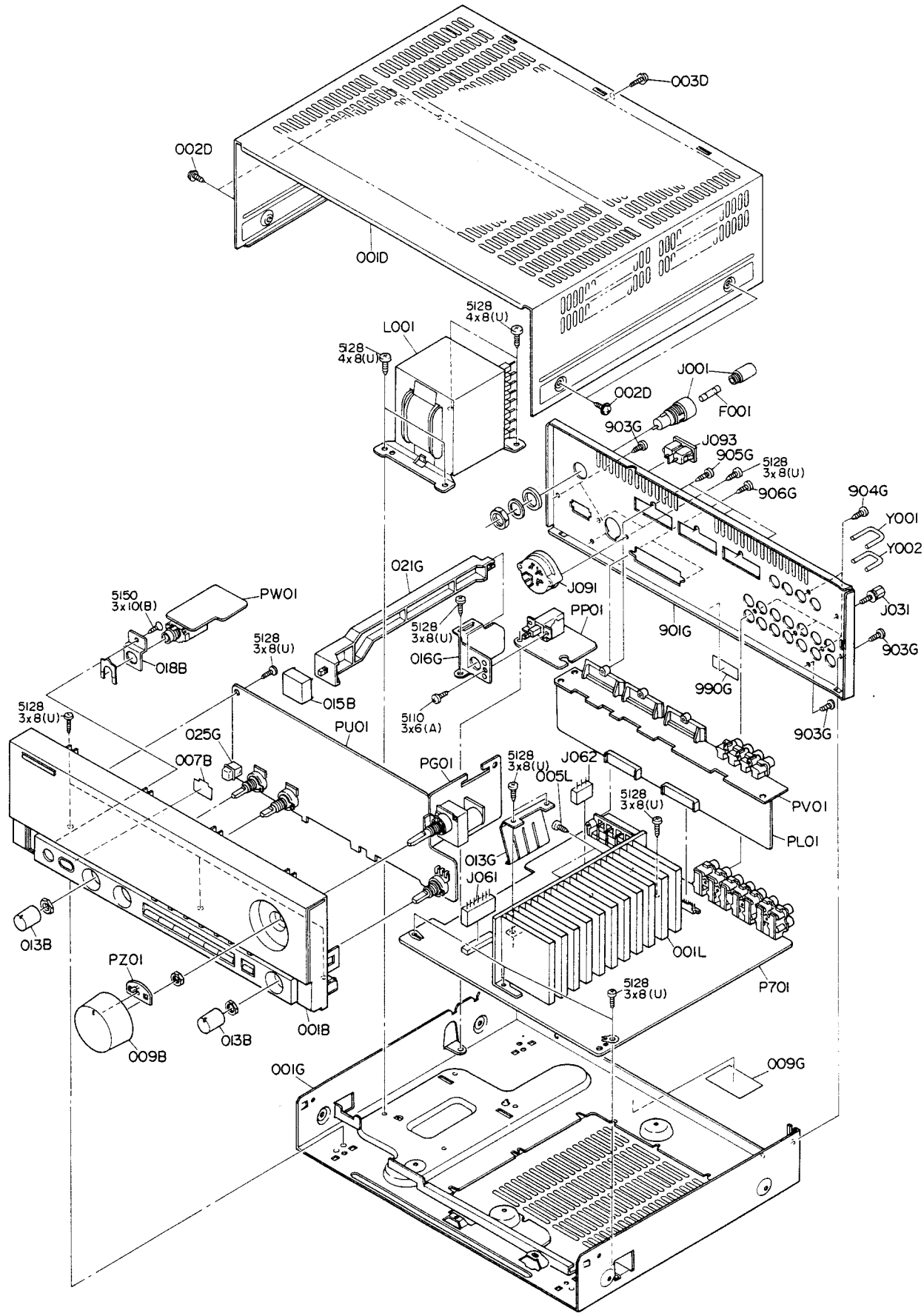
PL01



PV01



5. EXPLODED VIEW AND PARTS LIST



REF. DESIG.	PART NO.	DESCRIPTION
001B	4822 443 40756	Front Panel Assembly
009B	4822 413 41496	Knob Assembly, Volume
013B	4822 413 41495	Knob, Bass/Balance
015B	4822 410 26906	Button, Power
018B	4822 530 80511	Retainer, Phone Jack
001D	4822 443 40757	Lid, Top Cover
002D	4822 502 12355	B.T. Screw B3 x 8
003D	4822 502 12355	B.T. Screw B3 x 8
009G	4822 600 70229	Label, Caution
990G	4822 459 10843	Label, Serial No.
005L	4822 502 12499	Fin Neck, B.T Screw B3 x 15
⚠ F001	4822 253 30201	Fuse T1A 250V
⚠ J001	4822 256 30233	Jack, Fuse Holder
J031	4822 290 40297	Terminal, GND
J061	4822 265 10094	Jack, 7P
J062	4822 265 10093	Jack, 3P
J091	4822 272 10227	Voltage Selector [E]
⚠ J093	4822 267 30986	Plug, AC Inlet
⚠ L001	4822 146 21404	Power Transformer [A, N, T, W]
Y001	4822 264 10109	Shote Plug
Y002	4822 264 10109	Shote Plug
001T	4822 736 20152	User Manual
Z001	4822 218 30467	Unit (K), Remote Commander
Z002	4822 138 10296	Battery, SUM-4
Z003	4822 253 30206	Fuse T2A 250V
Z004	4822 265 10092	Jack, AC Adapter

ASSIGNMENT OF COMMON PARTS CODES.

RESISTOR

R***: (1) GD05 --- 140, Carbon film fixed resistor, ±5%, 1/4W
R***: (2) GD05 --- 160, Carbon film fixed resistor, ±5%, 1/6W

① — Resistance value

Examples

① Resistance value

0.1Ω...001	10Ω...100	1kΩ...102	100kΩ...104
0.5Ω...005	18Ω...180	2.7kΩ...272	680kΩ...684
1Ω...010	100Ω...101	10kΩ...103	1MkΩ...105
6.8Ω...068	390Ω...391	22kΩ...223	4.7MkΩ...475

(Note) Please distinguish 1/4W from 1/6W by the shape of parts used actually.

C***: CERAMIC CAP.

(1) DD1 --- 370, Ceramic condenser
Disc type
①② Temp. coeff. P350 ~ N1000, 50V
Capacity value
Tolerance

Examples

① Tolerance (Capacity deviation)
±0.25pF...0
±0.5pF...1
±5%...5

* Tolerance of COMMON PARTS handled here are as follows:
0.5pF ~ 5pF...±0.25pF
6pF ~ 10pF...±0.5pF
12pF ~ 560pF...±5%

② Capacity value

0.5pF...005	3pF...030	100pF...101
1pF...010	10pF...100	220pF...221
1.5pF...015	47pF...470	560pF...561

C***: CERAMIC CAP.

(1) DK16 --- 300, High dielectric constant ceramic condenser
Disc type
① Temp. chara. 2B4, 50V
Capacity value

Example

② Capacity value

100pF...101	1000pF...102	10000pF...103
470pF...471	2200pF...222	

C***: ELECTROLY CAP. (⧧), FILM CAP. (⧦)

(1) EA ------ 10, Electrolytic condenser
One-way lead type, Tolerance ±20%
①②
Dielectric strength
Capacity value

Examples

① Capacity value

0.1μF...104	4.7μF...475	100μF...107
0.33μF...334	10μF...106	330μF...337
1μF...105	22μF...226	1100μF...108
		2200μF...228

② Working voltage

6.3V...006	25V...025
10V...010	35V...035
16V...016	50V...050

(2) DF15 --- 350, Plastic film condenser
One-way type, Mylar ±5% 50V
①
Capacity value

Examples

① Capacity value

0.001μF (1000pF)...102	0.1μF...104
0.0018μF.....182	0.56μF...564
0.01μF.....103	1μF...105
0.015μF.....153	

6. ELECTRICAL PARTS LIST

REF. DESIG.	PART NO.	DESCRIPTION
		PG01-VOLUME CIRCUIT BOARD
RG01	4822 101 30583	Variable Resistor 50KΩ
JG01	4822 267 31035	Jack, 2P
JG02	4822 265 10064	Jack, 7P
		PL01-VIDEO AMP CIRCUIT BOARD
RL01	4822 111 41355	Resistor 75Ω 1/6W
RL02	4822 111 41355	Resistor 75Ω 1/6W
QL01	4822 209 83067	IC LC4066
QL02	4822 130 42715	Transistor 2SA608SP, etc.
QL03	4822 130 61227	Transistor DTA114ES, Digital
QL05	4822 130 42298	Transistor 2SC536SP, etc.
QL06	4822 130 42298	Transistor 2SC536SP, etc.
QL07	4822 130 42298	Transistor 2SC536SP, etc.
QL08	4822 130 42298	Transistor 2SC536SP, etc.
QL09	4822 130 42298	Transistor 2SC536SP, etc.
QL10	4822 130 42298	Transistor 2SC536SP, etc.
JL01	4822 266 30303	Terminal, 4P; RCA
		PP01-POWER SWITCH CIRCUIT BOARD
⚠ G001	4822 122 33276	Ceramic Cap. 0.01μF ±20%
⚠ S001	4822 276 12533	Push Switch, Power
		PU01-U-COM CIRCUIT BOARD
CU04	4822 122 40491	Ceramic Cap. 0.022μF +80% −20%
RF25	4822 116 52849	Resistor 220Ω ±5% ¼W
RF26	4822 116 52849	Resistor 220Ω ±5% ¼W
RF33	4822 101 30581	Variable Resistor 100KΩ
RF39	4822 101 30582	Variable Resistor 100KΩ(B)x2
RF40	4822 101 30582	Variable Resistor 100KΩ(B)x2
DF01	4822 130 33305	Diode 1SS176, etc.
DF02	4822 130 33305	Diode 1SS176, etc.
DG01	4822 130 32508	Diode RL103E, etc
DG02	4822 130 32508	Diode RL103E, etc.
DU01	4822 130 33305	Diode 1SS176, etc.
DU02	4822 130 33305	Diode 1SS176, etc.
DU03	4822 130 80325	L.E.D. LT3H8B
DU04 ~ DU09	4822 130 80326	L.E.D. LT3D8B
DU10	4822 130 33305	Diode 1SS176, etc.
QF01	4822 209 83631	IC NJM4558DD
QF02	4822 209 83631	IC NJM4558DD
QF03	4822 130 43818	Transistor 2SC2878(A)
QF04	4822 130 43818	Transistor 2SC2878(A)
QF05	4822 130 43818	Transistor 2SC2878(A)
QF06	4822 130 43818	Transistor 2SC2878(A)

REF. DESIG.	PART NO.	DESCRIPTION
QG01	4822 209 73287	IC LB1630
QU01	4822 209 73992	Microprocessor LM6413F
QU02	4822 130 42682	Transistor DTA144ES, Digital
QU03	4822 130 42298	Transistor 2SC536SP, etc.
QU04	4822 130 42682	Transistor DTA144ES, Digital
QU05	4822 130 42594	Transistor DTC144ES, Digital
QU06	4822 130 42682	Transistor DTA144ES, Digital
QU07	4822 130 42298	Transistor 2SC536SP, etc.
QU08	4822 130 10009	Photo Unit
FU01	4822 242 72397	Ceramic Vibrator CSB1000D
SU01 ~ SU07	4822 276 12455	Push Switch Tact
		PV01-REAR TERMINAL CIRCUIT BOARD
JV01	4822 266 30315	Terminal, 15P
JV02	4822 266 30306	Terminal, 13P
JV03	4822 266 30306	Terminal, 13P
JV04	4822 267 31034	Jack, 15P
JV05	4822 267 31034	Jack, 15P
		PW01-HEAD PHONE JACK CIRCUIT BOARD
RW01	4822 111 50474	Resistor 330Ω ±5% 1W
RW02	4822 111 50474	Resistor 330Ω ±5% 1W
JW01	4822 267 31033	Jack, Headphone
JW02	4822 265 10061	Jack, 5P
JW03	4822 462 71579	Stopper
WW01	4822 323 10054	Jumper Lead, 5P
		PZ01-VOLUME KNOB POINTER CIRCUIT BOARD
DZ01	4822 130 80326	L.E.D. LT3D8B
		P701-MAIN AMP CIRCUIT BOARD
		P701-CAPACITORS
CS03	4822 122 32486	Ceramic 0.01μF +80% −20%
CS04	4822 122 32486	Ceramic 0.01μF +80% −20%
C718	4822 124 41135	Elect 10μF 100V
C723	4822 122 32486	Ceramic 0.01μF +80% −20%[N]
C724	4822 122 32486	Ceramic 0.01μF +80% −20%[N]
C727	4822 122 32486	Ceramic 0.01μF +80% −20%
C728	4822 122 32486	Ceramic 0.01μF +80% −20%
C729	4822 122 40491	Ceramic 0.022μF +80% −20%
⚠ C801	4822 122 30043	Ceramic 0.01μF +80% −20%
C802	4822 124 41603	Elect 4700μF 50V
C803	4822 124 41603	Elect 4700μF 50V
C804	4822 122 32486	Ceramic 0.01μF +80% −20%
C805	4822 122 32486	Ceramic 0.01μF +80% −20%
C814	4822 122 40306	Ceramic 0.047μF +80% −20%
C817	4822 122 32486	Ceramic 0.01μF +80% −20%[N]

REF. DESIG.	PART NO.	DESCRIPTION
		P701-RESISTORS
R709	4822 116 52858	4.7Ω ±5% ¼W
R710	4822 116 52858	4.7Ω ±5% ¼W
R711	4822 116 60204	4.7Ω ±5% 1W
R712	4822 116 60204	4.7Ω ±5% 1W
⚠ R715	4822 115 90167	100Ω ±2% ¼W, Fuse
⚠ R716	4822 115 90167	100Ω ±2% ¼W, Fuse
R719	4822 116 55263	820Ω ±5% 1/6W
⚠ R802	4822 115 90166	10Ω ±2% ¼W
⚠ R803	4822 115 90166	10Ω ±2% ¼W
		P701-SEMICONDUCTORS
⚠ D701	4822 130 32508	Diode RL103E, etc.
⚠ D702	4822 130 32508	Diode RL103E, etc.
⚠ D703	4822 130 32508	Diode RL103E, etc.
QS01	4822 209 72357	IC LC7821
QS02	4822 209 83804	IC LC4966
QS03	4822 130 42298	Transistor 2SC536SP, etc.
Q401	4822 209 83631	IC NJM4558DD
⚠ Q701	4822 209 73988	IC STK4164
⚠ Q801	4822 209 83317	IC NJM7815
Q802	4822 130 61448	Transistor 2SD1666(R, S)
⚠ Q803	4822 209 83828	IC NJM79M15FA
⚠ Q804	4822 209 73674	IC NJM7806
⚠ Q805	4822 209 72332	IC NJM79M06FA
⚠ Q806	4822 209 70084	IC NJM7812
⚠ Q809	4822 209 73989	IC NJM78L18A
Q810	4822 130 42298	Transistor 2SC536SP, etc.
⚠ D801	4822 130 31007	Diode S4VB20
⚠ D802	4822 130 80907	Diode S2VB
⚠ D803	4822 130 32508	Diode RL103E, etc.
D804	4822 130 33305	Diode 1SS176, etc.
⚠ D805	4822 130 32508	Diode RL103E, etc.
⚠ D806	4822 130 32508	Diode RL103E, etc.
		P701-MISCELLANEOUS
⚠ F801	4822 253 30206	Fuse T2A 250V
⚠ F802	4822 253 30206	Fuse T2A 250V
JS01	4822 265 30397	Terminal, 4P; RCA
JS02	4822 265 30457	Terminal, 6P; RCA
JS04	4822 265 10064	Jack, 7P
JS08	4822 290 40209	Terminal, Earth
J401	4822 265 30397	Terminal, 4P; RCA
J701	4822 290 60752	Terminal, Speaker
J702	4822 265 10061	Jack, 5P
J703	4822 290 40209	Terminal, Earth
J801	4822 267 30978	Jack, Fuse Clip
J802	4822 267 30978	Jack, Fuse Clip
J803	4822 256 30329	Jack, Fuse Clip
J804	4822 256 30329	Jack, Fuse Clip
J805	4822 265 10118	Plug, 7P
J806	4822 265 20205	Plug, 3P
L701	4822 157 53898	Coil, Chook
L702	4822 157 53898	Coil, Chook
L703	4822 280 20197	Relay

(W01-99)	Assembly and Wiring
(T01-99)	Adjustment
(X01-00)	Correction

NOTE ON SAFETY:
Symbol ⚠ Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol ⚠. Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

7. TECHNICAL SPECIFICATIONS

AUDIO/VIDEO MASTER AMPLIFIER PM493

Power output

T.S.P. (Total System Power, EIJA, 6 Ohms)	140 W
DIN 8 ohms	2 × 50 W
T.H.D. (at 1/2 rated output)	0.1%
IM Distortion (at 1/2 rated output)	0.1%
Damping factor	45

Phono input

Signal to noise ratio	75 dB
Sensitivity	4.5 mV/47 kOhms

CD, CDV/TV/Video inputs

Input sensitivity impedance	400 mV/25 kOhms
Signal to noise ratio	90 dB
Frequency response	10 Hz – 50 kHz
Tone characteristic	100 Hz/10 kHz, ± 10 dB
Channel separation	>60 dB at 1 kHz

Video section

Sensitivity	1.0 V/75 Ohms
Output level	1.0V/75 Ohms
Dimension (W × H × D)	360 × 110 × 300 mm
Net weight	5.7 kg

Power supply

N version	220 V AC 50/60 Hz
T version	240 V AC 50/60 Hz
E version	110/120/220/240 V AC 50/60 Hz

**"SERVICE INFORMATION IS FOR USE BY QUALIFIED PERSONNEL ONLY —
ANY MISADJUSTMENT OR MISALIGNMENT MAY BE TREATED AS A NON-WARRANTY REPAIR BY ANY MARANTZ SERVICE CENTRE —"**

Kind of Common Parts

RESISTOR

R*** (1) GD05 .... 140, Carbon film fixed resistor, ±5% 1/4W
R*** (2) GD05 .... 160, Carbon film fixed resistor, ±5% 1/6W

C*** : **CERAMIC CAP.**
(1) DD1 ..... 370, Ceramic condenser, disc type (titan condenser) Temp. coeff. P350 to N1000 50V

C*** : **CERAMIC CAP.**
(1) DK16 .... 300, High dielectric constant ceramic condenser, disc type (titan variable) Temp. chara. 2B4 50V

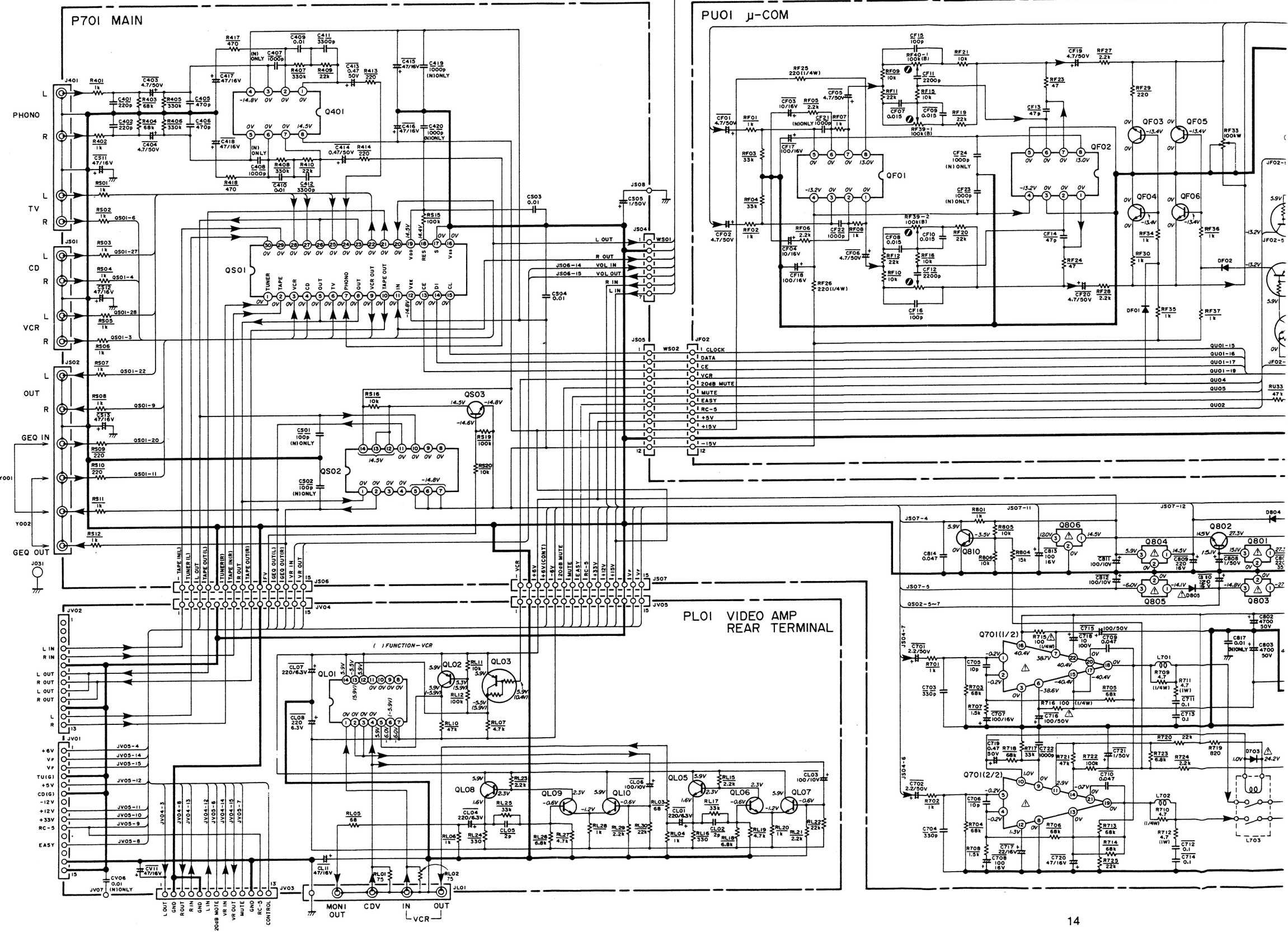
C*** : **ELECTROLY CAP. (⧧)/FILM CAP. (⧦)**
(1) EA ..... 10, Electrolytic condenser, one-way lead type, tolerance ±20%
(2) DF15 .... 350, Plastic film condenser, one-way type, Mylar, ±5% 50V

* In case of ordering the common parts, please establish the correct parts number of 10 figures by the procedure "ASSIGNMENT OF COMMON PARTS CODES"

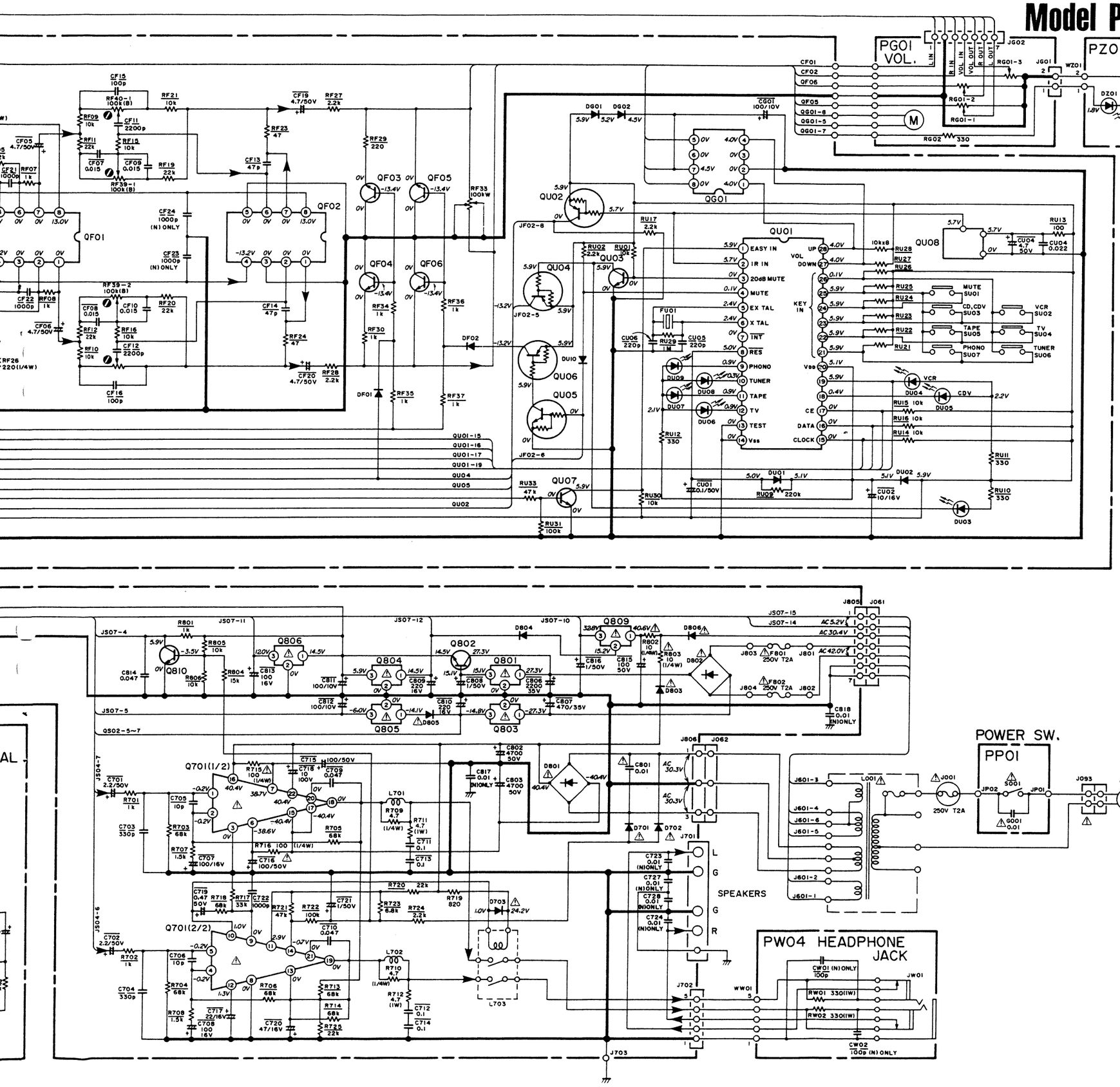
Components and wiring are subject to change for modification without notice.

NOTE ON SAFETY:
Symbol ⚠ Fire or electrical shock hazard. Only original parts should be used to replace any part marked with symbol ⚠. Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

8. SCHEMATIC DIAGRAM



Model PM493



Q401,QF01,QF02

NJM4558DD

Q701

STK4164II

Q801

NJM7815

Q802

2SD1666(R,S)

Q803

NJM79M15FA

Q804

NJM7806

Q805

NJM79M06FA

Q806

NJM7812

Q809

NJM78L18A

Q810,QL05~QL10
QS03,QU03,QU07

2SC536SP,etc.

QF03~QF06

2SC2878

QG01

LB1630

QL01

LC4066,etc.

QL02

2SA608SP,etc.

QL03

DTA114ES

QS01

LC7821

QS02

LC4966

QU01

LM6413F

QU02,QU04,QU06

DTA144ES

QU05

DTC144ES

QU08

PAS-C1604

D701~D703,D803
D805,D806,DG01,DG02

RL103E/DSF10C

D801

S4VB

D802

S2VB

D804,DF01,DF02
DU01,DU02,DU10

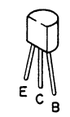
1SS176,etc.

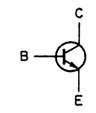
DU03

LT3H8B(YEL)

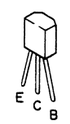
DU04~DU09,DZ01

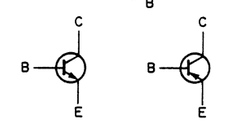
LT3D8B(RED)



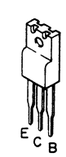


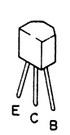
2SC2878

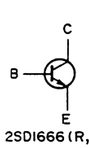


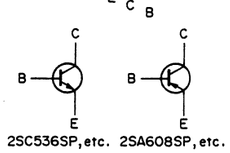


DTC144ES DTA114ES
DTA114ES

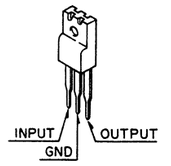


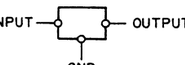




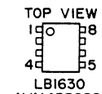


2SD1666(R,S) 2SC536SP,etc. 2SA608SP,etc.

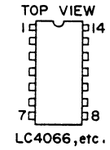




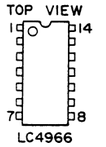
NJM7806,NJM7812
NJM7815,NJM78L18A
NJM7915FA,NJM79M06FA



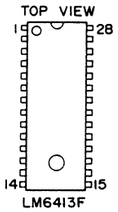
LB1630
NJM4558DD



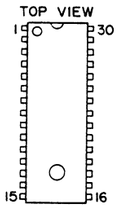
LC4066,etc.



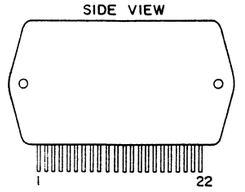
LC4966



LM6413F



LC7821



STK4164II